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Studies on Development and Evaluation of Spiced Vinegar Based Paneer Pickle

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Abstract

The study was conducted with an objective to develop and evaluate quality parameters of vinegar based paneerpickle. Different levels of vinegar (glacial acetic acid AR 3,4 and 5%) were tried along with coarsely grounded spices for development of product. The product was selected on the basis of sensory evaluation and analyzed for proximate composition, physicochemical properties and microbial quality. The spiced vinegar base paneerpickle with 4% acetic acid was highly acceptable by thepanelists.The results revealed that moisture, protein, ash, Ca, phosphorous and pH decreased significantly.It was observed that FFA,increased significantly and peroxide value and acidity increased non-significantly.However, NPN and shear Press Value remained similar to control.It is concluded that spiced vinegar based paneerpickle can be prepared without much affecting the sensory, physicochemical and microbial quality of fresh paneer.

Key words : *Milk, paneer, brine, pickle, nutrition.*

Introduction

Appropriate technology needs to be developed for conservation of milk solids available during flush seasons in order to provide security during lean months and natural calamities. Product diversification through value addition and amalgamation of milk solids with various food components need to be done with increase in purchasing power of average Indian consumer and the consequent changes in the taste preferences. There is ample scope for developing new range of dairy products. Paneer an acid coagulated indigenous milk product is widely used for culinary purposes. Pickling is one of the most ancient methods of preserving the food. Pickles are basically prepared by bringing or fermentation using different types of spices, salt vinegar sugar and edible oils.

Materials and Methods

Raw materials : The freshly drawn pooled buffalo milk was obtained from Experimental Dairy plant of Department of Animal Products Technology, CCS Haryana Agricultural University, Hisar, for preparation of paneer. The milk was standardised to 6 % fat and 9 % SNF.

Preparation of paneer : Fresh buffalo milk (5 litres) was standardised to a fat level of 6 %. The standardised milk was heated upto 90°C and coagulated at 70°C using one % solution of citric acid at the same temperature. After complete coagulation the stirring was stopped and the curd was allowed to settle down for 5 minutes. The whey was then drained through a muslin cloth. The curd was collected and filled in hoops. Pressure was applied on the top of the hoop by placing 10 kg weight for 10 minutes. The pressed block of paneer was removed from the hoop, cut into 4 pieces and immersed in chilled water (5°C) for 15 mm. After draining excess of water, Paneer was packed in polythene bags and kept at 5±1°C till further use.

Preparation of paneerpickle : A method suggested by Sandhu and Singh (1996) was followed for preparation of spiced vinegar based paneer pickle. Muslin bag containing ground spices was heated in vinegar solution at simmer temperature (85-95°C) for 1 hour with occasional stirring, in a covered vessel. After removing the spice bag, sugar was dissolved in vinegar to raise the Brix of vinegar to 40° and acidity of vinegar was studied at 3, 4 and 5% as acetic acid.

Recipe of spiced vinegar pickle

Ingredients	Quantity used
Acetic acid solution	onelitre (3, 4 and 5% acitic acid concentration)
Sugar	to bring 40° Brix value in vinegar solution (450 g/liter)
Clove (g)	3
Coriander (g)	3
Mustard seeds powder (g)	3
Ginger powder (g) (sonth)	3
Mace (g) (Jaiphal)	3

Sampling of pickles : For analysis the samples of paneer pickle were drawn using a clean sterilized stain less steel spoon, thoroughly clean with the help of tissue paper and sample was grounded with the help of porcelain pastel mortar. On the basis of preliminary trials, it was observed that pickle requiredripening time period was three days. Sampling for sensory evaluation, proximate composition was followed accordingly and this was considered as zero days in the present study.

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Table-1 : Organoleptic evaluation of different formulation of spiced vinegar pickle.

Spiced vinegar pickle treatments	Color and Appearance	Flavor (odor)	Texture	Taste	Overall acceptability
3% vinegar	5.60 ± 0.12	7.05 ± 0.48	6.60 ± 0.78	6.85 ± 0.44	6.55 ± 0.70
4% vinegar	6.80 ± 0.86	7.35 ± 0.66	7.20 ± 0.39	7.85 ± 0.74	7.30 ± 1.27
5% vinegar	6.65 ± 0.15	6.95 ± 0.70	6.55 ± 0.32	6.58 ± 0.28	6.68 ± 0.50
CD (P=0.05)	N.S.	N.S.	N.S.	1.03	N.S.

Values are mean ± SE, n=30

Table-2 : Proximate composition of fresh paneer and spiced vinegar paneer pickle.

Characteristics	Fresh Paneer		Paneer pickle		CD(P 0.05)
Moisture (%)	54.70	0.27	50.88	0.21	1.50
Protein (%)	54.70	0.27	17.52	0.58	N.S.
Fat (%)	18.30	0.56	28.75	0.96	1.42
Ash (%)	28.56	0.39	1.37	0.29	1.13
Calcium (mg/100 g)	1.56	0.19	263.00	0.01	6.29
Phosphorus (mg/100 g)	259.25	0.33	212.00	0.16	9.73

Values are Mean SE, n=6

Table-5 : Physico-chemical properties of fresh paneer and paneer pickle.

Characteristics	Fresh Paneer		Pickled paneer		CD(P 0.05)
NPN (%)	0.20	0.01	0.20	0.02	N.S.
FFA (as % oleic acid)	0.023	0.001	0.028	0.001	0.01
Peroxide value (meq/kg)	0.00	0.00	0.300	0.00	0.08
Acidity (%)	0.26	0.001	1.973	0.073	0.17
pH	5.75	0.050	4.03	0.088	0.24
Shear press value (kg/cm^2)	0.2		0.2		0.1

Values are Mean SE, n=6

Sensory evaluation of products : The developed paneer pickle formulation selected on the basis organoleptic evaluation was filled sterile glass bottle using moisture proof laboratory seal film and lids. Sensory evaluation including color and appearance, odor, body & 'texture, 'taste and overall acceptability attributes for fresh as well as stored samples of paneer pickles were evaluated organoleptically for their acceptability by a panel of semi-trained judges using 9- point Hedonic Scale.

Chemical analysis : Per cent moisture in paneer pickle was determined by as per method described in (1). Total protein was determined using micro kjeldahl method (2). Total protein was calculated by multiplying total nitrogen using factor of 6.38. The fat content of paneer pickle was determined by modified Mojonnier ether extraction method described in (3) for cheese analysis. The ash content of paneer pickle was determined at 550°C ± l0°C for 6 hours according to the method described for Chhana in (3). Calcium in the digested sample was determined by titration method. Phosphorus in digested sample was determined by (4) at 660 nm. The method as described by was followed for the estimation offree fatty acid andperoxide value by (2). The titrable acidity of paneer pickle was determined as per the procedure given in (3). The electrodes of pH meter were dipped in the thoroughly mixed sample and readings were recorded andthe process was repeated 2-3 times by dipping the electrodes. The shear press value of paneer pickle samples was determined by using Warner Bratzler Shear Press.

Statistical analysism : The data obtained from the various experiments during standardization process and storage studies were analyzed statistically by Two-way analysis of variance (ANOVA).

Results and Discussion

Sensory evaluation of spiced vinegar pickle : Mean sensory scores for color and appearance was recorded 5.60, 6.80 and 6.65, and for taste three types of spiced vinegar pickles varied significantly (P =0.05) with 6.85, 7.85 and 6.58, mean scores for 3,4 and 5% vinegar pickles, respectively (Table-1). However, mean sensory scores for other attributes were similar for different pickle and were in the range of 'like moderately'. The overall sensory attributeswere found highestwith addition of 4 % spiced vinegar pickle (like very much).

Proximate composition of fresh Paneer and spiced vinegar pickled paneer : Moisture content of spiced vinegar pickle was significantly lower than that of

freshpaneer (Table-2). It was probably due to presence of vinegar and spicemix in paneer pickle, because vinegar lowered the pH which reduced the water holding capacity of paneer pickle cubes (…). Spice mix ingredients incorporation increased the paneer pickle yield by lowered the moisture content in the final products. Total fat content decreased but non-significantly.

Physico-chemical properties : There was nodifference in non-nitrogen protein pickled paneer which is statistically same as in fresh paneer, NPN content in this study is same as reported 0.22 % by (5, 6). Free fatty acid in SVP was found to be non-significantly higher in spiced vinegar pickle as compared to fresh paneer. Peroxide value was found to be significantly higher (P = 0.05) in SVP. The increased PV observed in fresh pickle (except brine pickle) may be due to the processing technology used, addition of acetic acid, addition of spice which might be happened to increase the peroxide value but the typical pickle taste develop is likely to be suppressed as per the observation of sensory evaluation of the products. There was a wide variation in percent acidity in fresh paneer (0.26) and 1.973 0.073 observed in SVP.

Higher acidity in SVP was due to diffusion of acetic acid in paneer cubes. There was a significant difference (P = 0.05) in pH of fresh paneer 5.25 0.050 and 4.03 0.88**.** pH values in fresh paneer are found to 5.7 (7). Low pH in SVP was due to diffusion of acetic acid in paneer cubes. (7) also reported diffusion of citric acid into cubes of fresh and fried paneer; 4.68 (8). Shear press Value of fresh paneer and all types of pickles were observed to be 0.2 kg thereby indicating soft texture of paneer which remained unchanged during processing of pickle.

Conclusion

On the basis of the present study, it is concluded that the technology generated in the development of spiced vinegar pickle maybe be explored value addition for producing a safe paneer pickle with convenience and variety to the consumers.

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